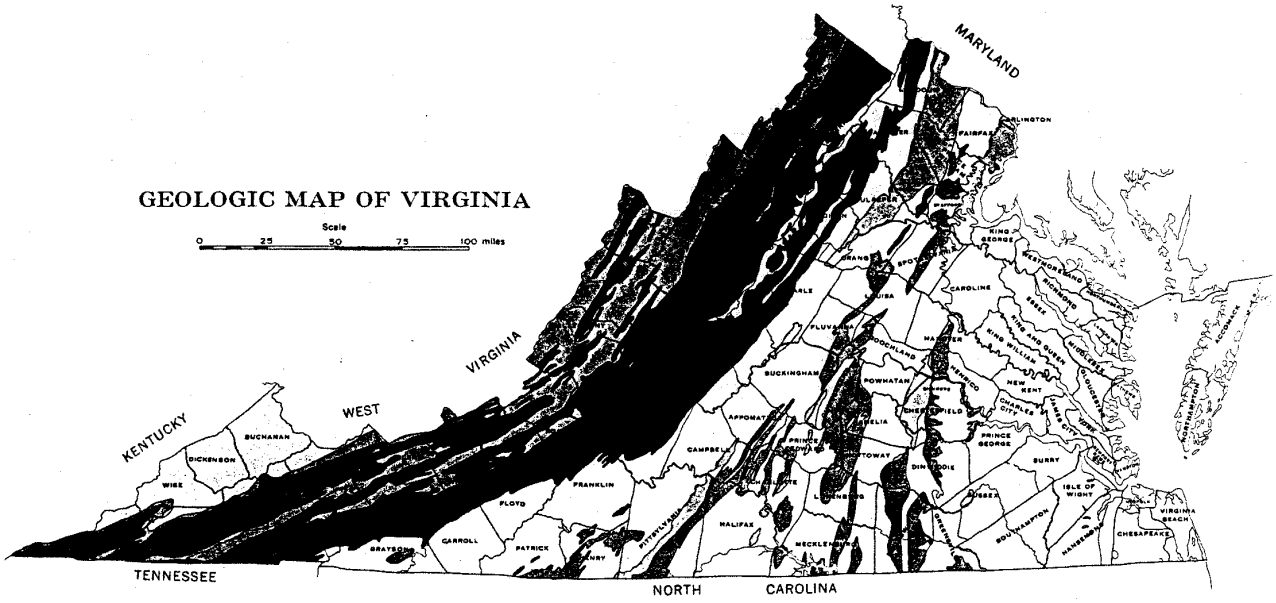
1994 *Ground Water Protection in Virginia*

Seventh Annual Report of the Ground Water Protection Steering Committee



See "Publications Available" section for information regarding the new 1993 Geologic Map of Virginia.

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FROM THE CHAIRS

This is the seventh in the series of Annual Ground Water Reports prepared by the Ground Water Protection Steering Committee (GWPSC). The purposes of these Reports are to assess each year's progress; to educate Virginia's citizens, businesses, and officials about the importance of ground water; and to publicize state programs that can assist those relying on ground water to ensure its continued quality and availability.

Ground water is essential to Virginians. In 60 of the Commonwealth's 95 counties, the majority of homes are served by private wells using ground water. In the majority of the state's counties, in fact, private wells are increasing faster than public water system hook-ups. In 30 counties, local public water supply systems rely entirely on ground water.

Not only do residents depend on these ground water based public systems, but so does business and industry. Some of the state's leading industries (e.g. Coors in Rockingham County, the Dupont facility in Waynesboro, Perdue Farms on the Eastern Shore, and others) have their own well systems. It is not an exaggeration to say that for many areas in Virginia, the ability to grow and to attract economic development in the future depends on ensuring an adequate supply of safe and healthy ground water.

The GWPSC was formed in 1986 with these facts in mind. It consists of representatives from nine state agencies. Its purposes are to combine the efforts of these nine agencies, to avoid duplication or confusion in actions where multiple agencies are involved, to maximize the state's ability to successfully compete for federal ground water funds, and to address the needs of various ground water users such as those listed above. Over the years, considerable success has been achieved in each of these areas as this and earlier Annual Reports have documented.

This year the Ground Water Protection Steering Committee reorganized itself. The GWPSC now consists of two Divisions- an *Executive Division* of agency heads or designees who provide leadership and oversee the work of the *Program Division* composed of key staff who are the technical experts of the state's ground water protection effort. The *Executive Division* will convene annually to hear *Program Division* reports, discuss issues, and give coordinated direction for the next round of activity. A more efficient effort is expected as a result of this reorganization.

Both divisions of the GWPSC will continue to be served by the Institute for Environmental Negotiation (IEN) of the University of Virginia. IEN assists and advises the committee in reaching consensus and in working with local governments, citizens, businesses and others concerned with ground water. By utilizing the services of this established and experienced program, the state is using its resources efficiently without adding new units to state government.

For the fourth year in a row, the GWPSC will be addressing specific ground water user needs, this time in the form of three regional workshops on wellhead protection. Several Planning District Commissions have requested this assistance. This is a good example of the kinds of service provided by the GWPSC.

Another activity for the coming year is to assess EPA's new Comprehensive State Ground Water Protection Program. When the GWPSC was first convened in the mid-1980s, it produced a Ground Water Protection Strategy for Virginia that has guided state activities ever since. Now, EPA is urging states to redo their strategies under a new program. This new program in not mandatory, but EPA is strongly urging states to participate. It would not be entirely accurate to call this program an "unfunded mandate" but in some regards it is. EPA is not, at this time, offering additional funding. Because of this and because the approved state strategy has remaining useful life, the GWPSC is looking closely to see whether it is in the state's best interest to participate in this new program.

Much has been going on this past year that the reader will find of interest and much work lies ahead for 1994 and 1995. This Annual Report, as can be seen from its Table of Contents, provides a window on both.

Bob Burnley
Chair, *Executive Division*

David Paylor
Chair, *Program Division*

PROGRAM ACTIVITIES

Leaking Underground Storage Tanks Head State Agenda

The protection of ground water resources has become a significant public issue in recent years as awareness of the threats to ground water has increased. A prime example is underground storage tanks (UST). Of the approximately 70,000 registered UST's in Virginia, over 7,000 are known to have leaked contaminants. It should be noted that registered tanks represent only a portion of the total number of USTs in Virginia because federal and state law exempts certain types of tanks from a registration requirement.

As tanks age, their integrity may deteriorate. Estimates are that the number of leaking underground storage tanks will surpass 10,000 or 15,000 before cleanup is completed. Leaking tanks can contaminate ground water as is illustrated below. Petroleum products, principally gasoline, diesel fuel, and heating oil are the most common contaminant and are very difficult to remove.

"One gallon of petroleum can make a million gallons of water toxic and unusable."

--from A General Guide to Environmental Regulations in Virginia

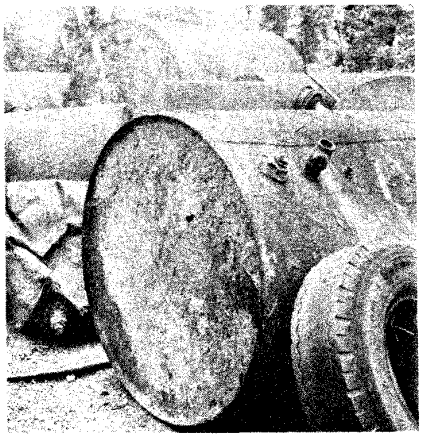
Government efforts have come in the form of both voluntary educational programs and mandatory requirements such as the federal and state Underground Storage Tank (UST) Regulations. The purpose of these regulations is to prevent and control releases of petroleum and substances listed in the Resource Conservation and Recovery Act (RCRA) in order to protect state waters from leaking underground storage tanks (LUST's).

One element of the state's effort, one that is especially important to property owners, is the Virginia Petroleum Storage Tank Fund (VPSTF), a revolving fund administered by the Department of Environmental Quality Water Division. Money is paid into the VPSTF from a

"fee" of two-tenths of a cent per gallon on motor fuel, special fuel, and home heating oil sold in Virginia. The VPSTF contained $25.6 million as of April 1, 1994. In the event of a petroleum release, the VPSTF may be used for purposes including payment of corrective action costs in instances where the owner or operator of the leaking tank is unknown or incapable of paying for the cleanup of the release; and/or reimbursement to owners and operators of tanks for the "reasonable and necessary" costs of cleanup in excess of the applicable state financial responsibility requirements. VPSTF monies can cover costs up to $1 million.

Another source of money for corrective action is the Federal Leaking Underground Storage Tank (LUST) Trust Fund. Virginia receives approximately $1.5 million each year from the Federal LUST Trust Fund, the majority of which is spent to provide alternative water supplies to people who have been found to have contaminated drinking water. In addition, the Federal LUST Trust Fund can cover corrective action costs in excess of $1 million and thus acts as a backup fund to the VPSTF.

When a leaking tank is suspected, a number of programs come into play. A response to a ground water contamination complaint may involve a site visit by DEQ staff. If contamination is found, the staff member attempts to identify the source and the responsible party for corrective action. This is not always easy. If a responsible party is unknown or unable to undertake corrective action, the State may step in to conduct an investigation and clean up as necessary.



What follows are three examples of leaking tank problems and how they have been addressed.

CASE #1: Shenandoah Valley

Nobody intends for their tanks to leak, but it does happen. One example originated on October 23, 1990 when high levels of gasoline vapors and liquid gasoline entered the basement of a residence in Harrisonburg in the northern Shenandoah Valley. The owner of the house notified the local fire department, who in turn notified DEQ. The problem appeared to subside after a short time. The property owner incurred approximately $6,600 in expenses for carpet cleaning, paint, and hotel bills for the renters who were temporarily evacuated.

The problem recurred on December 4th, 1992 and again in April of 1993 after heavy rain storms. After the April recurrence, the local fire department inquired about obtaining access to the VPSTF to mitigate the emergency. The fire department declared the situation an emergency and the VPSTF was accessed to provide $15,500 for emergency mitigation. This included an internal seal of the basement, an explosion proof pump and system to remove flood waters from the basement, a vapor extraction fan system, and a high level alarm.

Once the immediate hazards were abated, the State took over the case and is seeking to locate the source of the gasoline to eliminate the problem. Preliminary estimates for the costs of this investigation are $73,000. If this cost is correct, the total expenditure from VPSTF for this case will be around $88,500. If the petroleum tank is found that is believed to be the source of the hazards, the State will seek to recover monies for these expenditures from the owner or operator.

CASE #2: Tidewater

A second example involves a heating oil UST release at a residence located in Norfolk in the Tidewater area. In November 1989, fuel oil vapors were discovered in the basement of this residence. The following month a local consultant conducted an assessment to determine the source of the vapors. This assessment required installation of three ground water monitoring wells and sampling of five soil borings. Heating oil was found in all three wells and soil samples taken from the borings indicated high levels of hydrocarbon contamination from heating oil.

As a result of this analysis, DEQ's Tidewater Regional Office contacted the property owner about conducting further studies to define the extent of petroleum contamination in addition to considering the possible risks to human health and the environment. The owner was also required to develop a Corrective Action Plan (CAP) to clean up the site. CAP activities include excavating soils from the basement, replacing the basement floor, and recovery of fuel oil from the ground water monitoring wells. During the period between December 1989 and February 1994, the property owner spent more than $55,000 to assess and clean up this problem. The owner has applied for reimbursement from the VPSTF for these expenses.

Until this year, financial responsibilities for reimbursement to owners of residential properties remained the same as the financial responsibilities of industry - $50,000. This year the Virginia General Assembly lowered the level of responsibility for home owners. Beginning July 1st, 1994, owners of residential LUST sites may be reimbursed for eligible expenses exceeding $500, thus allowing residential property owners to receive a much greater amount of reimbursement than in the past.

CASE #3: Northern Neck

A third case exemplifies a situation in which the property owner is financially unable to pay for remediation efforts. In this instance, a Colonial Beach structure now used as a residence had been used as a general store from 1957 to 1967. During those years an estimated 550 gallons of gasoline leaked and impacted a well that provided the drinking water supply for the residence. Though the UST was removed and replaced by another tank the problem persisted. A second well was installed, but that too became contaminated.

The current property owners were determined to be the responsible party for the release. As the responsible party, they are required to provide an alternate water supply for the site and to conduct an investigation of the extent of the contamination. The property owners were financially unable to pay for this, however, and were able to document their "inability to pay." After DEQ certified the owners as being unable to pay, the VPSTF was accessed to provide an alternate water supply for the residence through the Alternate Water Supply program. Next, the State Lead Program, which also uses funds from the VPSTF, will conduct an assessment of the site and determine the corrective action approach to be implemented.

Each of these very ordinary and every day examples makes it clear that prevention is the best protection against ground water pollution because LUST detection and clean-up is difficult, expensive, and time consuming. Virginia's ground water protection strategy attempts to address these issues as well as increase public and private awareness of UST-related petroleum contamination problems so that in the future, leaking tanks will become unusual rather than common place.

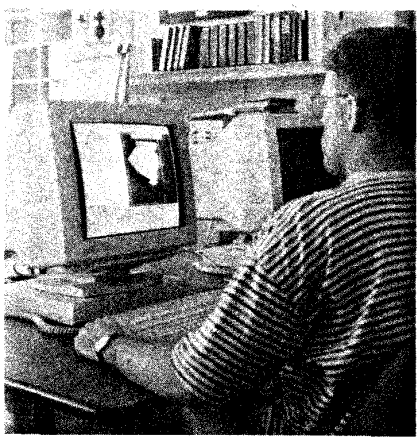
Wellhead Protection Workshops Are Planned

Several wellhead protection workshops are planned for later this year; three are being organized by the State, one by EPA, and four by the Virginia Rural Water Association (VRWA). The state workshops will cover all aspects of wellhead protection and include panels of local officials from Virginia communities who will describe their own experiences to date. The EPA workshop will focus on the application of Geographic Information Systems (GIS) to wellhead protection. It will be held in Virginia, but will draw participants nationally. The VRWA workshops are open to the public and will serve to educate businesses, local government officials, system owners, and private citizens about wellhead protection.

Wellhead protection is the term applied to describe a process for assessing potential threats to ground water, for managing land uses and activities in the areas near public wells, and for planning to prevent ground water contamination before it occurs. Since mid-1987, EPA has been encouraging States and localities to protect their ground water resources that serve as drinking water supplies by developing and implementing local Wellhead Protection Programs.

The purpose of the state-sponsored workshops is to acquaint Virginia local officials, planning district commissions (PDCs), utilities, and investors with wellhead protection issues and various strategies and policies available for starting protection programs. Localities can learn about the need for wellhead protection and alternative strategies from other Virginia local governments who have similar experiences. Local governments are essential participants because of their authority over land use and because of local government's frequent role as a utility supplying public water needs.

Once the three locations are identified for these workshops, each location will be paired with surrounding PDC's and panelists represented in the publication Wellhead Protection: Case Studies of Six



Local Governments in Virginia. The Institute For Environmental Negotiation (IEN) will facilitate and moderate each workshop.

In addition to these workshops, EPA is sponsoring a more specialized two-day workshop on November 15th and 16th to be built around wellhead protection projects using Geographic Information Systems (GIS). The core of the agenda will be presentations of specific wellhead protection/GIS projects. Among the participants will be officials from the mid-Atlantic states such as West Virginia, North Carolina, Maryland, Delaware, Pennsylvania, and South Carolina. There will also be sessions on related non-GIS topics (e.g. variations in the types of land use controls applied in wellhead protection areas, dealing with pre-existing uses, addressing property owner concerns, issues of implementation/enforcement, etc.). An informal information sharing session is also planned for the evening of the workshop.

One of the targeted audiences will be regional planning district commissions/ Councils of Government. These regional agencies are frequently interested in ways to better assist and serve their member local governments. Regional efforts are especially helpful where costs for systems such as GIS could be shared in order to make projects feasible where they might not be for a single locality.

The VRWA workshop will be held on September 28th at the Rappahannock Community College. This workshop will include information regarding the State's wellhead protection efforts as well as

information on VRWA's wellhead protection programs of providing technical assistance to operators of municipal, cooperative, or private water systems serving less than 10,000 individuals. Three other VRWA workshops will be scheduled throughout the State at a later date.

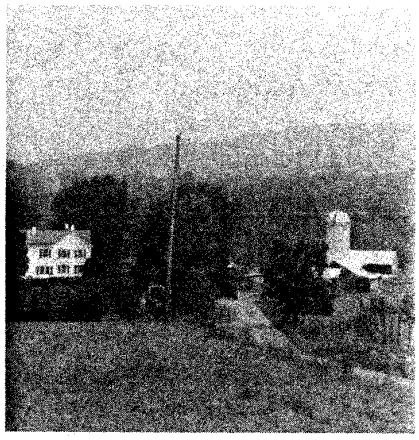
1994 is the fourth year that the Ground Water Protection Steering Committee has worked with local governments to protect their public wells. Many public water supplies in Virginia depend wholly or in significant part on ground water wells. Replacement supplies or treatment would in most cases prove very expensive or impractical. For this reason, wellhead protection is an important part of an overall ground water resource protection and pollution prevention strategy.

For copies of the publication mentioned above and for questions about wellhead protection, contact: Mary Ann Massie, DEQ Water Division, at (804) 527-5201. For information about the Virginia or EPA workshops, contact the Institute at (804) 924-1970. For information on the VRWA workshops, contact Ken Coffman, VRWA, at (703) 261-7178.

*Pollution Prevention In Rural America:Virginia's Farm*A*Syst Program*

A farmstead is more than a home and more than a center for farming operations - it is also serves as the wellhead that provides a rural household's water supply. On a typical farmstead, several million gallons of ground water can be within 100 feet of the surface containing farmstead facilities such as fuel tanks, chemical and fertilizer storage tanks, livestock holding areas, and wastewater disposal systems. This ground water is relied upon for drinking and other domestic uses and is susceptible to contamination from above-ground activities.

To combat this potential problem, a national educational/technical assistance program, Farmstead Assessment System (Farm*A*Syst), offers farmers and rural residents the opportunity to assess and identify water pollution risks on their own property. The program is designed to



increase participants' knowledge and understanding of pollution risks in farmstead environments so that users can develop an action plan to reduce the risks identified. Participation is entirely voluntary and is based on the property owner seeing that it is in their own interest to protect their ground water.

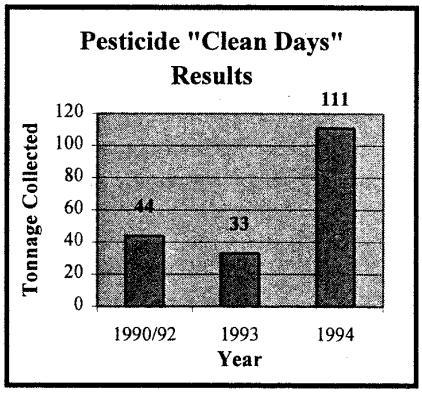
Virginia's implementation of the Farm*A*Syst program began in 1993 when a multi-agency effort was initiated. This state-wide effort is coordinated by the Biological Systems Engineering Department at Virginia Tech with active participation by the Virginia Division of Soil and Water Conservation and Virginia Cooperative Extension. Others involved include: USDA Soil Conservation Service, Virginia Department of Agriculture and Consumer Services, Virginia Farm Bureau Federation, and Virginia Association of Soil and Water Conservation Districts.

The primary objective of the Virginia Farm*A*Syst program is to complement and enhance existing water quality protection programs. But most importantly, it helps bring home the need for ground water protection in rural Virginia.

The Farm*A*Syst package consists of worksheets and supporting fact sheets which guide a farmer or rural resident in a step-by-step analysis of potential sources of ground water contamination. Information available includes factors that influence pollution risks, health and/or legal concerns, and sources of additional information or assistance. The worksheets provide a numerical ranking system to evaluate pollution risks to an individual water supply. The package, when completed, can be used by technical and educational agency personnel, or by individual farmstead owners themselves, with the ultimate goal of preventing and/or correcting ground water and related surface water contamination. For additional information, contact Tamim Younos at Virginia Tech, at (703) 231-4385.

Pesticide "Clean Days" Expanded in 1994

Old pesticides that are unwanted or unusable and are not disposed of properly can present unnecessary risks to both ground and surface waters as well as create other risks. To address this problem, the Virginia Department of Agriculture and Consumer Services (VDACS) has conducted four pesticide disposal projects (or "Clean Days") involving a total of thirty-four localities in Virginia. The 1990 and 1992 Clean Days disposed of over 44 tons of unwanted pesticides from Accomack, Nelson, Northhampton, Nottoway, Rockingham, Frederick, Clarke, and Northumberland counties. In mid-August of 1993, VDACS conducted its third Clean Day in the counties of Rappahannock, Southampton, and Warren and in the city of Suffolk, collecting 33 tons of unwanted pesticides. The 1994 disposal project netted over 111 tons from twenty-two localities—the largest Clean Day yet. The twenty-two localities that were assisted by the 1994 disposal were: Albemarle, Amherst, Augusta, Bedford, Carroll, Charles City, Culpeper, Greensville, Fauquier, Floyd, Franklin, Henrico, Isle of Wight, James City, Montgomery, New Kent, Pittsylvania, Prince George, Pulaski, Roanoke, Sussex, and Lynchburg.



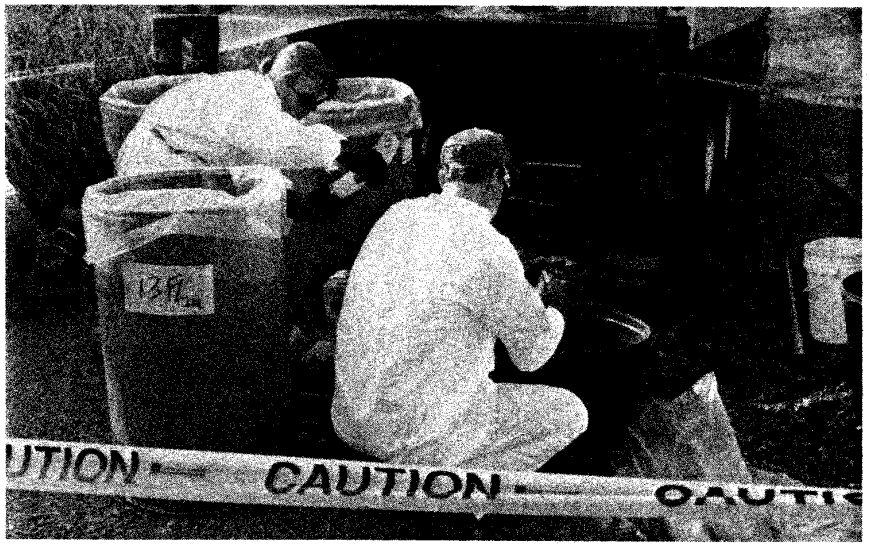
The 1994 disposal project was able to serve such a large number of localities because of increased funds from grants and cooperation between several agencies. The Environmental Protection Agency provided approximately $237,000 through a Federal Insecticide, Fungicide and Rodentcide Act grant to VDACS. The Department of Conservation and Recreation made a grant of $50,000 from its Section 319 non-point source funds from EPA. The Department of Environmental Quality contributed $80,000 from its Section 106 Ground Water Protection Grant funds. In addition, VDACS used some of the pesticide fees that it collects.

Implementation of Clean Day projects is also a cooperative venture - this time between VDACS, the Cooperative Extension Service (Extension), and the Consolidated Laboratory in the Department of General Services (Lab). VDACS contracts with a licensed hazardous disposal company to pick up the unwanted pesticides from farms and other sources. Prior to the collection day, the local Extension agent surveys agricultural producers and other pesticide users in the locality to determine who is interested in participating and what chemicals will be involved. If identification is impossible, a sample is sent to the Lab for testing. On collection day, the hazardous waste disposal contractor sends a truck to the farms to pick up the unwanted pesticides.

Among pesticides disposed of in this year's project were DDT, lead arsenate, dieldrin, 2,4,5-T, and toxaphene. Most of the pesticides, about 95 percent, are incinerated at an EPA-licensed incinerator in Georgia. Pesticides containing heavy metals are buried at an EPA licensed landfill after having been packed in steel drums.

Assuming that funding remains available, VDACS intends to continue having Clean Days every year until each Virginia locality that wishes has been served.

For more information about Virginia's Pesticide Disposal projects, contact Dan Schweitzer, at VDACS', Office of Pesticide Management, at (804) 371-6558.



Pesticides and Ground Water: State Completes Management Plan

Some pesticides are highly soluble and can easily seep through soils to present threats to ground water resources. Other pesticides cling to soil particles rather than leaching into ground water. To help prevent contamination of ground water, the Environmental Protection Agency has begun reviewing pesticides for their potential to leach into ground water and has announced its intention to start a list of those pesticides that present the greatest threats of ground water contamination.

Once EPA has identified the most highly leachable pesticides, each state must develop a detailed plan for each such pesticide, showing how the state will manage that pesticide so as to prevent its contamination of ground water. EPA will ban the use of such pesticides in states that do not have EPA-approved management plans. In other words, states that wish to keep farmers', nursery growers', homeowners', lawn care companies', foresters' and others' ability to continue using a listed pesticide must show EPA that the state will manage the pesticide's use wisely.

To aid the states in developing these plans, EPA urges them to first develop what is called a "generic state management plan," or generic SMP, as preparation for developing a specific management plan for individual pesticides. The generic plan sets out the state's overall strategy and general approach. In 1994, Virginia completed a final draft of its generic SMP, which will be submitted to EPA for review.

Virginia's Generic SMP seeks to accomplish two things: ensure the continued availability of pesticides to Virginia's agricultural industry and other pesticide users, and to protect ground water. As Virginia's generic SMP notes, "Though it is a well worn phrase, prevention is the best policy when it comes to ground water. Once contaminated, it is often either impossible or infeasible to restore it to its previous condition."

Rather than taking a "one-size-fits-all" approach, the state management plan process allows states to predicate their protection activities on the actual conditions within the states, which can vary widely. As explained in Virginia's Generic SMP, "The SMP [planning] process allows the state to target its response to those parts of the state where the pesticide is actually used, and to assign priorities to areas that are hydrologically the most vulnerable [to contamination] and where the greatest number of homes, communities and businesses are relying on ground water." This targeted approach can be particularly important during times when both the public and private monies are limited.

Virginia's Generic SMP is based on what is called a "graduated response"

philosophy. When a pesticide is found in ground water, no more and no less a response will be made than is called for by the severity of the problem. When no problem is found, the goal is to continue to avoid contamination and current prevention practices will be continued. If a small amount of pesticide is detected in ground water, the goal is to prevent any further contamination, and so a review would be made of current Best Management Practices (BMPs) and educational programs, for instance, in order to see where practices need improving. If contamination levels increase, efforts would be stepped up and consideration would be given to requiring BMPs and/or requiring additional user certification training. If such preventive actions are successful, there would be no need to go further. If contamination persisted, however, and the continued beneficial uses of ground waters or surface waters hydrologically connected to ground water were threatened, then strict controls would be considered or the benefit of the pesticide would be re-evaluated in light of that experience. The goal of the plan is to establish a strategy to prevent contamination of ground water by pesticides designated by EPA as "high leachers."

The Virginia Department of Agriculture and Consumer Services is designated in the Generic SMP as the "lead agency." It will be the source of all information and updates about the status of any SMP procedures. In the future, VDACS will work with a Pesticide SMP Planning Committee consisting of Virginia Cooperative Extension, the Department of Health, the Department of Conservation and Recreation, and the Department of Environmental Quality.

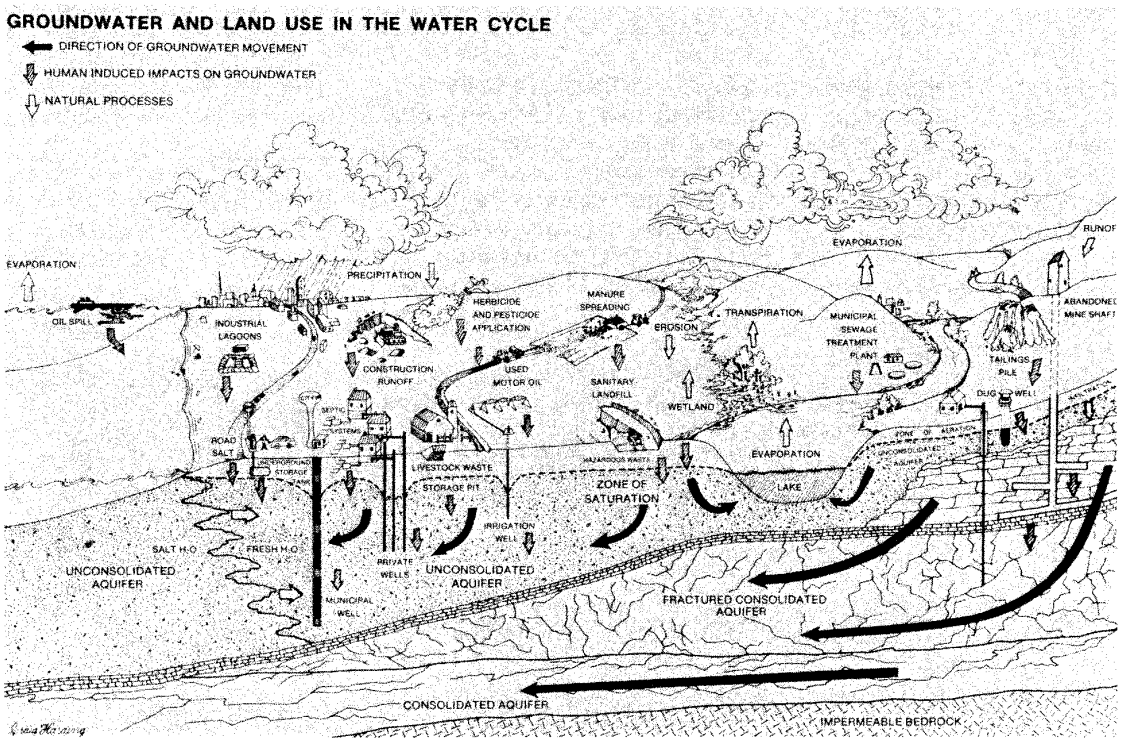
Copies of Virginia's generic SMP are available from the Office of Pesticide Management, Virginia Department of Agriculture and Consumer Services, at (804) 371-6558.

Surface Linked Ground Water Being Studied

As a result of federal and state drinking water regulations, the Virginia Department of Health, Division of Water Supply Engineering has embarked on a study to identify those waterworks supplied by ground water sources which represent "Ground Water Under the Direct Influence" (GWUDI) of surface waters. The waterworks being investigated are those that derive their water from springs, wells in karst geology, or wells which are of poor or unknown construction. Due to the geologic nature of Virginia, most of the waterworks under investigation are west of the Blue Ridge Mountains. The study came about as a result of federal regulations and provisions in the Safe Drinking Water Act (SDWA).

If a source is found to be a GWUDI, that source is then considered a surface water source and must meet all current and future drinking water regulations regarding surface waters. In most cases, this would mean increased water sampling, including bacteriological and chemical tests. The study is expected to be completed by early summer 1994. This evaluation will also be ongoing in the sense that in the future if the water quality from a ground water source is found to change due to changing land use conditions, well deterioration, or other conditions, a new evaluation of the water source will be made and the surface water requirements might then become applicable.

Additional information is available by contacting the Office of Water Programs, VDH, at (804) 786-6278.



Ground Water Activities in the Chesapeake Bay Region

The Chesapeake Bay Local Assistance Department is currently reviewing the comprehensive plans of Tidewater local governments for consistency with the Chesapeake Bay Preservation Act and its Regulations. Under these measures, localities must address water quality protection, including the protection of ground water resources, in their comprehensive plans. Comprehensive plans should identify ground water recharge areas, discuss how different land uses may affect ground water quality, and consider how actions in one locality may result in impacts to another's water supply.

The review has revealed a wide spectrum in awareness of ground water issues among local governments, as reflected in their comprehensive plans. Some localities, dependent upon surface water sources for their drinking water, may have in the past perceived ground water issues as having limited applicability in their jurisdiction. These localities have only recently begun to collect and analyze relevant data. Other localities, wholly dependent upon wells, have long been aware of the relationship between land use and ground water quality and have taken steps to protect this resource. For example, Northampton County on the Eastern Shore has created an overlay district for recharge areas where the use of impervious surfacing is limited and where restrictions have been placed on potentially hazardous land uses.

To date, the Local Assistance Board has formally reviewed nine localities' plans for consistency. The comprehensive plans that have been reviewed by the Board have been found generally consistent with the Chesapeake Bay Preservation Act and Regulations, but with the condition that additional analysis be undertaken to strengthen local policy on water quality protection issues.

The Department is also focusing attention on ways to assist local governments with the establishment of the database necessary to track and enforce the five-year septic pumpout requirement of the Regulations. The reason for this requirement is that the proper functioning of a septic system and its ability to treat waste water can best be maintained by periodic cleaning. In addition, the Board has funded a pilot study to determine the capacity and options for septage disposal in the Three Rivers Health District to ensure that when septic tanks are pumped out, the septage is properly treated and disposed of so as not to impact ground water or other natural resources.

The Board is also seeking grant funding to develop a ground water component to the Polecat Creek Water Quality Monitoring Study underway in Caroline County. The study currently involves physical, chemical, and biological monitoring of streams in the watershed, analysis of rainfall quality and quantity, a land use land cover database, and development and implementation of an environmental education curriculum. A more complete understanding of water quality and quantity in this pilot study area requires that ground water also be included.

Non-residential Septic Tanks Pose Hidden Threat

The U.S. Environmental Protection Agency (EPA) has found that septic systems which receive industrial waste, as contrasted with household waste, can pose a substantial contamination threat to underground sources of drinking water. Historically, the concern about ground water contamination by septic systems has focused on the release of harmful micorogranisms associated with sanitary wastes and subsequent water-borne disease outbreaks. EPA's Underground Injection Control (UIC) program, however, has identified numerous septic systems which are used for "non-sanitary" waste disposal, revealing an added threat to underground sources of drinking water. Septic systems, cess pools, and dry wells which received non-domestic, industrial wastes are considered to be shallow injection wells.

Virtually all industries generate waste waters of some type and volume. Often times these wastes are discharged to the public sewage system for treatment. EPA's implementation of the Underground Injection Control program has identified numerous commerical/industrial facilities which commingle industrial wastewater with domestic sewage for disposal into septic systems or shallow injection wells. What is alarming is that septic systems do not adequately treat many of these industrial wastes, yet such systems are common in many areas. Furthermore, unsewered areas often rely on private ground water supplies to fulfill domestic needs compounding the potential threat.

Industries which have generated waste waters of concern include automotive sales, service, and repair facilities; electrical and electronics equipment manufacturers; plastics, chemical, and pharmaceutical manufacturers; metal finishers and machine shops; dry cleaning, photofinishing, and printing shops. Contaminants which may be discharged to septic systems from these facilities include industrial solvents and degreasers, used crankcase and lubricating oils, synthetic organic chemicals, and heavy metals. Many of these wastewater constituents pass through to ground water untreated.

EPA Region III in Philadelphia is responsible for implementing the UIC program in Virginia, Pennsylvania, and the District of Columbia. The EPA initiative involves facility inspections and appropriate follow-up, including cessation of discharge, permitting, pollution prevention, waste minimization, and ground water cleanup when necessary.

If you would like to know more about the EPA Underground Injection Control program contact Karen Johnson at (215) 597-9928 or Mark Nelson at (215) 597-2783.

LEGISLATIVE EFFORTS

Ground Water Management Act Amendments Gained by Municipalities

The 1994 session of the Virginia General Assembly amended sections 62.1-260 and 62.1-263 of the Ground Water Management Act at the request of major municipal water supply systems in southeast Virginia. The results of these amendments will be the allocation of approximately 11.5 million additional gallons a day of ground water.

The City of Norfolk will be the largest beneficiary of the amendment with an increase in allocated withdrawals of approximately 10.6 million gallons per day. Portsmouth, Franklin, Virginia Beach, West Point, Exmore, and Parksley will receive additional allocations that range from .6 to .007 million gallons per day.

Section 62.1-260 was amended to tie ground water withdrawal permits to the amount of ground water that was withdrawn during any consecutive twelve month period between July 1, 1980 and June 30, 1992. This amendment applies to to political subdivisions or community waterworks, regulated by the Virginia Department of Health, who had been previously issued a permit or certificate under the Ground Water Act of 1973.

Section 62.1-263 was amended to require the Water Control Board to use the average of the actual historical ground water usage of this group of users when evaluating the available supply of ground water with respect to a new ground water withdrawal application. This amendment specifically prohibits the Water Control Board from using the total permitted amount of ground water withdrawal allocated to this group of users when evaluating a new ground water withdrawal application.

Aboveground Storage Tank Amendments Delay Deadline

The 1994 General Assembly amended Article 11 of the State Water Control Law to provide additional exemptions to current pollution prevention requirements. Facilities not engaged in the resale of oil from aboveground storage tanks will not be subject to pollution prevention regulations promulgated pursuant to section 62.1-44.34:15.1 until July 1, 1995 or any date later specified by the Board. The deadline extension resulted from a recognition that there is a design and operational difference in "resale" and "non-resale" facilities such that the most urgent need for increased environmental protections is "resale" sites.

Where resale of oil is involved, the law required compliance by June 23, 1993. Pollution prevention actions include installation of safety fill and shutdown equipment, inventory controls, leak detection devices, facility inspections, facility and piping tests, and personnel training.

The 1994 General Assembly also amended Article 10 of the State Water Control Law Section 62.1-44.34:11A.2.h. to reduce the amount that non-commercial, private owners of small ASTs and USTs would have to spend on cleanup before being able to draw from the Virginia Petroleum Storage Tank Fund (VPSTF). The VPSTF may now be used to reimburse costs above $500 up to $1 million. For more information on the VPSTF see an earlier article in this issue.

Virginia Residential Property Disclosure Act Includes Ground Water

Ground water has for years been regarded as an "out of sight, out of mind" sort of thing. However, a 1993 law, the Virginia Residential Property Disclosure Act, will be bringing ground water issues to the forefront of some real estate transactions. As a result, people will become more aware of the connection that exists between land use and ground water.

The Act requires owners of residential real estate to either disclose any defects in the property or disclaim disclosure by stating the property is sold "as is" in which case the buyer must do their own investigation to discover any defects. When making the disclosure, owners will use a form developed by the state Real Estate Board in accordance with this regulation. The owner is under no obligation to discover defects; rather, they are required to fill out the form to the "best of their knowledge" about the particular property. Such

Ground Water Management Areas in Virginia

Accomack County	**King William County**	**City of Norfolk**
Isle of Wight County	**New Kent County**	**City of Portsmouth**
Northampton County	**York County**	**City of Suffolk**
Prince George County	**Chesterfield County ***	**City of Virginia Beach**
Southampton County	**Hanover County ***	**City of Hampton**
Surry County	**Henrico County ***	**City of Newport News**
Sussex County	**City of Chesapeake**	**City of Poquoson**
Charles City County	**City of Franklin**	**City of Williamsburg**
James City County	**City of Hopewell**	

*** Only those portions east of I-95 are included.**

disclosure is to include defects of which the owner has actual knowledge regarding: (1) insulation, (2) structural systems including roof, walls, floors, foundation, and any basement; (3) plumbing, electrical, heating, and air conditioning systems; (4) wood-destroying insect infestation; and (5) other material defects known to the owner. Ground water-related defects could include:

- the property's water and sewer systems, including knowledge of defects about the source of household water, water treatment system, or waste water disposal method
- hazardous or regulated materials on the property including asbestos, lead-based paint, radon, and underground storage tanks such as heating oil tanks
- land use matters impacting the property and the ground water beneath it

The Virginia Residential Property Disclosure Act serves as an important consumer protection device and reflects a new attitude in terms of making people more aware of how actions can and do impact ground water resources.

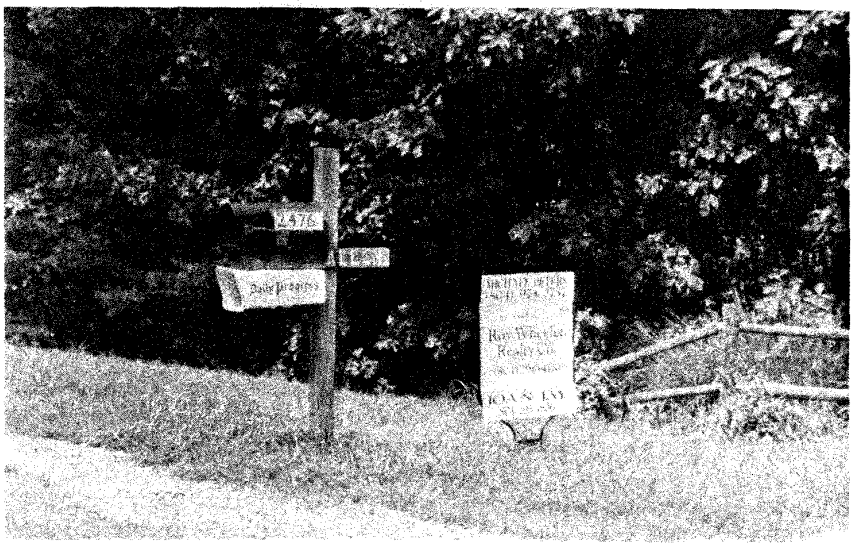
For more information on the Virginia Residential Property Disclosure form, contact the Virginia Real Estate Board at (804) 367-8552.

Federal Water Laws Pending Reauthorization: An Update

Safe Drinking Water Act (SDWA)

This year Congress is expected to consider legislation revising the SDWA and its 1986 amendments. A Senate bill to reauthorize SWDA (S 2019) cleared the Senate 95-3 in May and will now be considered by the House.

One feature of this measure is that it would allow local officials and states greater flexibility in setting drinking water standards and would reduce the number of chemicals regulated, focusing on those believed to pose the greatest health risks. Smaller communities, with water systems serving fewer than 10,000 people, would be allowed to meet more lenient requirements than large urban systems, to use less



costly technology, and to conduct fewer tests for contaminants. This portion of the bill has drawn controversy because its critics' think that the bill allows communities to use less effective means of dealing with cancer-causing chemicals. The bill would also establish a federally-supported $1 billion-a-year revolving loan fund to be used by states and local authorities to pay for water treatment projects. This could be helpful to Virginia because it is estimated that local governments here will have to spend nearly $2 billion over the next 10 years to comply with federal safe drinking water requirements.

The current House measure (HR 3392) to reauthorize the SDWA contains no new provisions relating to ground water and so it is not clear how Congress will bring the various approaches together in the end.

Clean Water Act (CWA)

Clean Water Act reauthorization bills are expected to be passed by the House and Senate later this year. They contain new federal mandates for states to protect ground water resources. Under the Clean Water Act, Senate bill 1114 calls on each state to conduct a Comprehensive State Watershed Inventory. Under this proposal, states would be required to include both priority ground waters and drinking water supplies in their inventories. These inventories would be used in such Clean Water Act programs as watershed management and nonpoint source programs. These linkages are important for coordination between watershed management programs, drinking water programs, and ground water programs operating within the same watershed. In the House, HR 3948 goes further, amending the overall goal of the Clean Water Act to include the protection of ground water that is in direct hydrological connection to surface water. In addition, the House bill requires each state to evaluate the relationship between pollution of ground water, surface water, aquatic sediment, and wetlands. HR 3948 contains provisions similar to S 1114 that include consideration of ground water resources in the nonpoint source and watershed protection programs.

Resource Conservation and Recovery Act (RCRA)

RCRA regulates the identification, transportation, treatment, and storage of solid and hazardous waste throughout the nation. Although reauthorization has been expected, the Congressional Liaison Division does not now expect reauthorization to go through Congress in the coming year.

The significance of the SDWA and CWA reauthorization bills is great. Some of the hardship felt by the smaller water suppliers may be eased while at the same time ground water may emerge for the first time as an equal with surface water in the attention paid to it as a water supply source and as a resource.

RESEARCH

Statewide Ground Water Vulnerability Assessment Continues

The Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation (DCR-DSWC) has recently completed a statewide study characterizing ground water vulnerability based on soil permeability and pesticide usage. The purpose of this effort is to assist in prioritizing and targeting geographical areas of the state where ground water monitoring is needed to support the implementation of future Pesticide State Management Plans (see earlier article).

Average soil permeabilities for the various soil layers and soil types was calculated to the depth of the seasonal high water table or to the depth of the parent material. The source of soils data was the State Soil Geographical Data Base (STATSGO) available from U.S. Soil Conservation Service. Pesticide usage data for the 12 major agricultural crops in Virginia was obtained from the Virginia Department of Agriculture and Consumer Services (VDACS). Pesticide usage of 19 highly leachable pesticides was determined for each of the 97 counties/cities in the state based on two categories - total treatment acres and total pounds of pesticides applied to agricultural crops. The jurisdictions were ranked from highest to lowest for each of the two categories and from these rankings an accumulative score per jurisdiction was compiled.

DCR-DSWC has produced a report explaining the methodology and study findings. A copy of this report and a 11"x17" state-wide ground water vulnerability map, in color, is available upon request by contacting Charlie Lunsford, DCR-DSWC, (804) 371-8984.

As a follow up to this initial statewide ground water vulnerability assessment, DCR-DSWC, in conjunction with the Information Support Systems Laboratory at Virginia Tech, is producing maps of the soil leaching potential of cropland at a sub-county/city level. Eighteen localities are to be mapped using the Virginia Geographic Information System (VIRGIS). The localities include: Accomack, Augusta, Chesapeake, Essex, Fauquier, Greensville, Hanover, Isle of Wight, King and Queen, King William, Loudon, Northampton, Northumberland, Richmond, Rockingham, Suffolk, Virginia Beach, and Westmoreland. VDACS will later select one of these 18 localities for the purpose of conducting a pilot ground water monitoring program for pesticides.

Virginia Water Resources Research Center Sponsors Studies

During 1992-1994, the Virginia Water Resources Research Center is sponsoring 26 research projects and short-term investigations of high priority to the Commonwealth, most of which are related to ground water resources. Virginia Tech, Virginia Commonwealth University, the University of Virginia, George Mason University, Virginia Military Institute, the University of Richmond, Virginia Institute of Marine Science, and the College of William and Mary are all involved in carrying out this research which also provides training for 19 students.

Examples of projects include: examination of bacterial viruses as indicators of ground water contamination by septic systems; evaluation of the roles of wetlands in nitrate removal and trapping phosphorous; quantification of the subsurface flow paths within wetlands and interactions of wetland porewaters with surface waters in the Ready Creek Watershed; effects of soil bacteria on the rate of benzene degradation in ground water.

In addition to the regular sponsored research program for 1992-1994, the Water Center is also funding a special program of mini-grants supporting work done by undergraduate and graduate

students at the UR, VMI, and VPI. A total of 16 mini-grants have been awarded to 21 students in several disciplines, including agricultural engineering, biology, chemistry, civil engineering, crop and soil environmental science, fisheries and wildlife, geology, and sociology. Students with mini-grant program funding are researching a wide variety of ground water-related topics such as: the effects of ground water pollution on cave fauna in the southern Appalachians; evaluation of nonpoint source pollution from fertilizers in suburban water tables; water quality and sustainable agriculture; analysis of data from a household water quality education program; and developing a geophysical procedure for detecting leachate concentrations in or beneath landfills. For more information regarding the Virginia Water Resources Research Center or its on-going projects, contact Dr. Diana Weigmann at (703) 231-5624.

U.S.G.S. Study Examines Water-Quality in the Potomac River Basin

In 1991, the U.S. Geological Survey (USGS) implemented a long-term National Water Quality Assessment (NAWQA) program. The objective of this program is to describe and explain trends in the quality of the Nation's surface and ground water.

The Potomac River Basin, and specifically the Muddy Creek Watershed in Rockingham County, Virginia, was among the first 20 NAWQA study units selected for investigation under the program. The goal of studying the Potomac River Basin, and the Muddy Creek Watershed in particular, is to understand local scale occurrence and distribution of nutrients and pesticides in ground and surface water. Data are to be taken from samples drawn from streams and wells throughout the year. This data will then be used for comparative studies on a national and regional basis. At present, USGS has installed their test wells and will complete a sampling by the end of June 1994. Data will be available as tests are completed. Information on technical reports and hydrologic data related to the NAWQA program can be obtained from: Matthew Ferrari, U.S.G.S. Water Resources Division at (410) 828-1535.

PUBLICATIONS AVAILABLE

• New publications available from the Department of Mines, Minerals, and Energy (D.M.M.E.) include the **1993 Geologic Map of Virginia**. This map was previously updated in 1963. The new map shows over 300 different formations at a scale of 1:500,000 (one inch equals approximately 8 miles). The map is accompanied by an expanded explanation of the rock units on the map and a list of other references containing more detailed geologic data. The 1993 Geologic Map of Virginia is available for $9.50, plus tax, from the DMME, Division of Mineral Resources, P.O. Box 3667, Charlottesville, Virginia, 22903, phone, (804) 293-5121.

• Geology and Mineral Resources of the Southwest Virginia Coalfields is a second recently completed publication from D.M.M.E. This report describes coal distribution and correlation, potential limestone and sandstone resources, and geologic faults, folds, and lineaments in the counties of Wise, Dickenson, and Buchanan, and portions of Lee, Scott, Russell, and Tazewell. The report was prepared to aid companies and individuals who have an interest in the safe and environmentally sound economic development of Southwestern Virginia and is the result of a cooperative project between DMME and the U.S. Department of the Interior, Office of Surface Mining. This report, Publication 131, is available for $28.00, plus tax, from the DMME, Division of Mineral Resources, P.O. Box 3667, Charlottesville, Virginia 22903, phone, (804) 293-5121.

• "Regulations Update" is a new monthly summary of all proposed regulations, amendments or repeals currently being considered by the Virginia Department of Environmental Quality (DEQ) and its citizen regulatory boards. This publication is available from DEQ's Public Affairs Office and copies can be obtained by calling DEQ at (804) 762-4440.

• For copies of Wellhead Protection: A Handbook for Local Governments in Virginia or Wellhead Protection: Case Studies of Six Local Governments in Virginia, contact Mary Ann Massie, DEQ Water Division, at (804) 527-5201.

• Copies of Virginia's Generic Pesticides and Ground Water SMP are available from the Office of Pesticide Management, VDACS, at (804) 371-6558.

• Copies of the statewide Ground Water Vulnerability Assessment report and a 11"x17" map are available upon request by contacting Charlie Lunsford, DCR-DSWC, at (804) 371-8984.

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Water quality preservation is everyone's concern.
If you suspect a pollution incident has occurred, please call:

Department of Emergency Services

1-804-674-2400 24-hour hotline